CORRECTED VERSION

PATENT COOPERATION TREATY

PCT

12 JAN 2005

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference MTO 03 134	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. **PCT/AU2003/000910**	International Filing Date *(day/month/year)* 14 July 2003	Priority Date *(day/month/year)* 12 July 2003

International Patent Classification (IPC) or national classification and IPC

Int. Cl. [7] C07K 19/00, A61K39/00, A61K 39/21, A61K 39/245, A61K 39/29

Applicant

CSL LIMITED et al

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 3 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheet(s).

3. This report contains indications relating to the following items:

I	☒	Basis of the report
II	☐	Priority
III	☐	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
IV	☐	Lack of unity of invention
V	☒	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
VI	☐	Certain documents cited
VII	☐	Certain defects in the international application
VIII	☐	Certain observations on the international application

Date of submission of the demand	Date of completion of the report
22 January 2004	5 February 2004
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer **DAVID GRIFFITHS** Telephone No. (02) 6283 2628

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.
PCT/AU2003/000910

I. Basis of the report

1. With regard to the **elements** of the international application:*

- [ ] the international application as originally filed.
- [X] the description, pages **1 - 48,** as originally filed,
  pages , filed with the demand,
  pages , received on with the letter of
- [X] the claims, pages **49, 50, 52-55,** as originally filed,
  pages **51,** as amended (together with any statement) under Article 19,
  pages , filed with the demand,
  pages , received on with the letter of
- [X] the drawings, pages **1 - 10,** as originally filed,
  pages , filed with the demand,
  pages , received on with the letter of
- [ ] the sequence listing part of the description:
  pages , as originally filed
  pages , filed with the demand
  pages , received on with the letter of

2. With regard to the **language,** all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language which is:

- [ ] the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- [ ] the language of publication of the international application (under Rule 48.3(b)).
- [ ] the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- [X] contained in the international application in written form.
- [ ] filed together with the international application in computer readable form.
- [ ] furnished subsequently to this Authority in written form.
- [ ] furnished subsequently to this Authority in computer readable form.
- [ ] The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- [ ] The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

4. [ ] The amendments have resulted in the cancellation of:
   - [ ] the description, pages
   - [ ] the claims, Nos.
   - [ ] the drawings, sheets/fig.

5. [ ] This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report*

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims 1 - 27	YES
	Claims	NO
Inventive step (IS)	Claims 1 - 27	YES
	Claims	NO
Industrial applicability (IA)	Claims 1 - 27	YES
	Claims	NO

2. Citations and explanations (Rule 70.7)

The present invention relates to methods for designing candidate polypeptides for expression in a suitable host comprising identifying at least one hydrophobic peptide sequence and arranging or re-locating at least one of the identified sequences to generate a polypeptide with reduced amplitude in hydrophobicity and/or length of any hydrophobic regions. Specific polypeptide sequences and vaccines are also claimed.

This report is based on the following citations:

D1. US 6,070,126;
D2. WO 2000/063693;
D3. *Molecular Immunology* (1996), vol. 33, no. 2. pp. 145-155;
D4. WO 2001/047541;
D5. WO 1996/003144; and
D6. WO 1997/005164.

US 6,070,126 describes the identification of protein epitopes of optimal length characterised by a hydrophobic-hydrophilic-hydrophobic motif. The citation does not teach or suggest the arranging or re-locating of sequences to generate a polypeptide with reduced amplitude in hydrophobicity and/or length of any hydrophobic regions and so the present claims must be acknowledged as being novel and inventive over this citation.

WO 2000/063693 also describes the identification of protein epitopes characterised by a hydrophobic-hydrophilic-hydrophobic motif. The citation does not teach or suggest the presently claimed invention and so the present claims must be acknowledged as being novel and inventive over this citation.

Molecular Immunology (1996), vol. 33, no. 2. pp. 145-155 discloses the statistical comparison of established T-cell epitope predictors against antigen databases to discover which predictors are statistically relevant. The present claims must be acknowledged as being novel and inventive over this citation.

WO 2001/047541 relates to methods of designing polyepitopic vaccines comprising multiple HLA epitopes to provide increased immunogenicity by sorting the multiple HLA epitopes to minimise the number of junctional epitopes (epitopes created by the juxtaposition of two other epitopes. The citation does not teach or suggest the presently claimed invention and so the present claims must be acknowledged as being novel and inventive over this citation.

WO 1996/003144 discloses a recombinant cytotoxic T lymphocyte vaccine comprising at least one recombinant protein including a plurality of epitopes from one or more pathogens wherein the protein is substantially free of sequences naturally found to flank the cytotoxic T lymphocyte epitopes. The citation does not teach or suggest the presently claimed invention and so the present claims must be acknowledged as being novel and inventive over this citation.

WO 1997/005164 discloses a papillomavirus polyprotein construct comprising at least two sequences of an early ORF protein of papillomavirus fused together either directly or indirectly. The citation does not teach or suggest the presently claimed invention and so the present claims must be acknowledged as being novel and inventive over this citation.

All claims meet the criterion of being industrially applicable.